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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,933	02/08/2002	Patrick Brindel	Q68315	6540

7590 06/28/2005  
Moser, Patterson & Sheridan, L.L.P.  
3040 Post Oak Boulevard  
Suite 1500  
Houston, TX 77056

EXAMINER
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LI, SHI K

ART UNIT	PAPER NUMBER
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2633

DATE MAILED: 06/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/067,933

Applicant(s)

BRINDEL ET AL.

Examiner

Shi K. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 8-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-20 is/are allowed.
- 6) ☒ Claim(s) 1-5 and 8-11 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. FIG. 1 and FIG. 2 are objected to under 37 CFR 1.84(o) because there are no descriptive legends for the boxes. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4, 8-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Daza et al. (M. Daza, et al., "All-Optical WDM-to-TDM Conversion with Total Capacity of 33 Gb/s for WDM Network Links", IEEE Journal of Selected Topics in Quantum Electronics, Vol. 3, No. 5, October 1997) in view of Horiuchi et al. (U.S. Patent 5,726,789).

Regarding claim 1, Daza et al. teaches in FIG. 3 a WDM-to-TDM conversion comprising a non-linear optical mirror (NOLM) with a data access and a probe access. The data access receives WDM data from EDFA and the probe access receives a clock signal of wavelength  $\lambda_{\text{probe}}$  from a hybrid mode-locked semiconductor laser (HML-SL). The NOLM outputs an optical data of wavelength  $\lambda_{\text{probe}}$ . Daza et al. explains in p. 1289, left col., last paragraph that the bit rate of the clock is  $F_0$  and the bit rate of each wavelength channel is  $F_0/N$ . The difference between Daza et al. and the claimed invention is that Daza et al. does not teach a multiplier for

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generating the optical clock signal. Horiuchi et al. teaches in FIG. 1 to use a multiplier to convert a clock signal from a low frequency oscillator 12-1 to a high frequency clock signal, which is used to modulate light generated by a laser as illustrated in FIG. 4(b). One of ordinary skill in the art would have been motivated to combine the teaching of Horiuchi et al. with the WDM-to-TDM conversion apparatus of Daza et al. because a low frequency oscillator is easier to design and more stable in operation than a high frequency oscillator. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a multiplier to convert a low frequency electrical clock signal into a high frequency electrical clock signal and convert the electrical clock signal into an optical clock signal, as taught by Horiuchi et al., in the WDM-to-TDM conversion apparatus of Daza et al. because a low frequency oscillator is easier to design and more stable in operation than a high frequency oscillator.

Regarding claim 2, Daza et al. includes in FIG. 3 optical filter at the output.

Regarding claim 4, Daza et al. teaches in FIG. 3 a NOLM.

Regarding claim 8, Horiuchi et al. teaches in FIG. 4b an electro-absorption modulator.

Regarding claim 9, Horiuchi et al. teaches in col. 3, lines 9-10 a Mach-Zehnder modulator.

Regarding claim 11, Daza et al. teaches in FIG. 3 a plurality of data accesses to the combiner, on which a plurality of wavelength channels are launched.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daza et al. and Horiuchi et al. as applied to claims 1, 2, 4, 8-9 and 11 above, and further in view of Mikkelsen et al. (U.S. Patent 6,614,582 B1).

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Daza et al. and Horiuchi et al. have been discussed above in regard to claims 1, 2, 4, 8-9 and 11. The difference between Daza et al. and Horiuchi et al. and the claimed invention is that Daza et al. and Horiuchi et al. do not teach to use a SOA Mach-Zehnder interferometer as a wavelength converter. Daza et al. teaches in p. 1288 that the function of the NOLM is wavelength conversion. Mikkelsen et al. teaches in FIG. 1A a SOA Mach-Zehnder interferometer wavelength converter. One of ordinary skill in the art would have been motivated to combine the teaching of Mikkelsen et al. with the modified WDM-to-TDM conversion of Daza et al. and Horiuchi et al. because SOA Mach-Zehnder interferometer wavelength converter has high conversion efficiency, extinction ratio enhancement and low chirp characteristics. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use SOA Mach-Zehnder interferometer wavelength converter, as taught by Mikkelsen et al., in the modified WDM-to-TDM conversion of Daza et al. and Horiuchi et al. because SOA Mach-Zehnder interferometer wavelength converter has high conversion efficiency, extinction ratio enhancement and low chirp characteristics.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daza et al. and Horiuchi et al. as applied to claims 1, 2, 4, 8-9 and 11 above, and further in view of Tai (U.S. Patent 6,275,322 B1).

Daza et al. and Horiuchi et al. have been discussed above in regard to claims 1, 2, 4, 8-9 and 11. The difference between Daza et al. and Horiuchi et al. and the claimed invention is that Daza et al. and Horiuchi et al. do not teach to use an interleaver for multiplexing different wavelength channels, instead, Daza et al. uses a combiner to combine wavelength channels. However, using interleaver for multiplexing wavelength channels is well known in the art. For

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example, Tai teaches in FIG. 14 to use interleavers 1410, 1420 and 1430 to multiplex wavelength channels. One of ordinary skill in the art would have been motivated to combine the teaching of Tai with the modified WDM-TDM conversion of Daza et al. and Horiuchi et al. because interleavers are inexpensive and have good filtering characteristics. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use interleavers for multiplexing different wavelength channels, as taught by Tai, in the modified WDM-TDM conversion of Daza et al. and Horiuchi et al. because interleavers are inexpensive and have good filtering characteristics.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daza et al. and Horiuchi et al. as applied to claims 1, 2, 4, 8-9 and 11 above, and further in view of Naoe et al. (U.S. Patent 6,678,479 B1).

Daza et al. and Horiuchi et al. have been discussed above in regard to claims 1, 2, 4, 8-9 and 11. The difference between Daza et al. and Horiuchi et al. and the claimed invention is that Daza et al. and Horiuchi et al. do not teach a distributed feedback (DFB) laser. However, it is well known in the art that DFB laser is commonly used for DWDM because it has accurate wavelength. For example, Naoe et al. teaches in FIG. 5 a DFB laser. One of ordinary skill in the art would have been motivated to combine the teaching of Naoe et al. with the modified WDM-to-TDM conversion of Daza et al. and Horiuchi et al. because the DFB laser of Naoe et al. can be integrated together with a modulator and, therefore, gives a compact module as illustrated in FIG. 8. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to use DFB laser, as taught by Naoe et al., in the modified WDM-to-TDM

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conversion of Daza et al. and Horiuchi et al. because the DFB laser of Naoe et al. can be integrated together with a modulator and gives a compact module.

***Allowable Subject Matter***

7. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 13-20 are allowed.

***Response to Arguments***

Regarding the objection to the drawings, the Applicant argues that 37 CFR 1.84(o) states only that suitable descriptive legends may be required where necessary for understanding the drawings (emphasis added by Applicant) and all of the elements in both Figures 1 and 2 are clearly numbered and described plainly in the text of the specification. The Examiner disagrees. Since 37 CFR 1.84(p) requires that reference numbers be explained in the specification, the Applicant's interpretation of 37 CFR 1.84(o) would render any descriptive legends unnecessary. The Examiner interprets 37 CFR 1.84(o) to imply that if a symbol is not commonly recognized, a descriptive legend is necessary. Standardized symbols such as those for amplifier, laser diode, etc. are commonly recognized and descriptive legends are not necessary. Objects with special shape, such as cellular phone, keyboard, and computer are also commonly recognized and descriptive legends are not necessary. In the particular case of FIG. 1 and FIG. 2 of instant application, rectangular boxes such as 8, 10, 11 and 15 cannot be recognized by Examiner without referring to the specification. Therefore, descriptive legends for those boxes are necessary for understanding the drawings. In addition, the specification does not give any

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explanation of the box labeled 11. Therefore, the Applicant's argument that "all of the elements in both Figures 1 and 2 are clearly numbered and described plainly in the text of the specification" cannot be sustained.

9. Applicant's arguments with respect to claims 1-5 and 8-11 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 571 272-3031. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).




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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

skl

23 June 2005

  
JASON CHAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600